

Remarks

Preliminary Matters

No Claims have been added. Therefore, no additional fees are required. If determined otherwise, the Office is authorized to charge Deposit Account No. 07-1077 for the amount.

Claim Objections

Applicants have amended Claims 1 and 20 to correct the spelling of "flame-retardant" and thank the Office for careful reading in that regard. Applicants have replaced "laminated" with "attached" in Claims 18 and 20 to correct the structural interaction objected to by the Office. Support for "attached" is found in the Specification at Page 14, Line 11.

§ 103 Rejections

In the Non-Final Office Action mailed May 11, 2006, the Office made 15 different §103 combination-reference rejections. In Applicants' amendment and response of August 11, 2006, Applicants overcame most, if not all, of those rejections. In the Final Office Action mailed on August 22, 2006, the Office has rejected all pending claims using 24 different §103 combination-reference rejections. In order to prepare for Allowance or Appeal, Applicants have made an amendment to Claims 1 and 11 to clarify the polyolefin alloy now claimed by including the octene co-monomer from Claims 4 and 14, respectively, and limiting the types of polyolefins to be used, inferentially from Claims 4 and 14, in the polyolefin alloy. Claim 4 was retained because it offers the differentiation of two polyethylenes and ethylene-vinyl-acetate copolymer¹.

¹ The Office was encouraged to consider the patentability of dependent Claim 4 in the August 11, 2006 response, but no comment to that specific effect was offered in the Final Rejection of August 22, 2006.

To address all 24 rejections, Applicants use a chart which shows the deficiencies of the combination of the 6 primary and 4 secondary references.²
Applicants also incorporate their response of August 11, 2006 herein by reference.

Primary Reference and its Disclosure and Inadequacy(ies)	Secondary Reference	Inadequacy of Combination vis-à-vis Claims
5,091,462 (Fukui et al.) -- discloses grafted polypropylene (g-PP) and a polyamide modified with clay (clay-PA), not a polyolefin alloy (POA) of polyethylene or ethylene-vinyl-acetate and elastomeric olefin copolymer, plus intercalated nanoclay	5,889,087 (Hayashi et al.)	Pending claims require POA, not g-PP. No disclosure in '087 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,232,377 (Hayashi et al.)	Pending claims require POA, not g-PP. No disclosure in '377 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,414,070 (Kausch et al.)	Pending claims require POA, not g-PP. As stated in the August 11, 2006 response, Kausch et al. limits themselves in amount of optional inorganic flame retardant well below that claimed by Applicants as significant to the ASTM E84-01 flame test.
	6,750,282 (Schall)	Pending claims require POA, not g-PP. No disclosure in '282 of a second type of polyolefin to modify the modulus of the first type of polyolefin to provide "hand" for use as films and sheets for surface coverings.
6,492,453 (Ebrahimian et al.) -- discloses polyolefin blend but not a POA in which one is an elastomeric olefin copolymer.	5,889,087 (Hayashi et al.)	Pending claims require POA as defined, not polyolefin blend. No disclosure in '087 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,232,377 (Hayashi et al.)	Pending claims require POA as defined, not polyolefin blend. No disclosure in '377 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.

² Formation of this chart does not concede the presence of any Teaching-Suggestion-Motivation between the primary and secondary references in any of the 24 combinations used for rejection. Applicants and the Office undoubtedly await the opinion of the U.S. Supreme Court in KSR International v. Teleflex litigation on the proper way to combine references.

Primary Reference and its Disclosure and Inadequacy(ies)	Secondary Reference	Inadequacy of Combination vis-à-vis Claims
	6,414,070 (Kausch et al.)	Pending claims require POA as defined, not a polyolefin blend. As stated in the August 11, 2006 response, Kausch et al. limits themselves in amount of optional inorganic flame retardant well below that claimed by Applicants as significant to the ASTM E84-01 flame test.
	6,750,282 (Schall)	Pending claims require POA as defined, not polyolefin blend. No disclosure in '282 of this second type of polyolefin in the POA to modify the modulus of the first type of polyolefin to provide "hand" for use as films and sheets for surface coverings.
6,924,334 (Fukutani et al.) -- discloses one or more polyolefins but not a POA in which one is an elastomeric olefin copolymer.	5,889,087 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '087 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,232,377 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '377 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
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2005/0032959 (Cheung et al.) -- discloses one or more specific polypropylenes but not a POA in which one is an elastomeric olefin copolymer with octene monomer.	5,889,087 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '087 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,232,377 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '377 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.

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	6,414,070 (Kausch et al.)	Pending claims require POA as defined, not any two polyolefins. As stated in the August 11, 2006 response, Kausch et al. limits themselves in amount of optional inorganic flame retardant well below that claimed by Applicants as significant to the ASTM E84-01 flame test.
	6,750,282 (Schall)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '282 of this second type of polyolefin in the POA to modify the modulus of the first type of polyolefin to provide "hand" for use as films and sheets for surface coverings.
2006/155035 (Metzenmacher et al.) -- This is not a valid prior art reference under §103 because the PCT publication was July 29, 2004 and in German, and the USA publication was July 13, 2006. Applicants' first filing date is June 17, 2003. Moreover, there is no disclosure of an ethylene-octene elastomeric olefin copolymer. ³	5,889,087 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '087 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
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³ For review of the publication date and language of the PCT application, please go to:
<http://v3.espacenet.com/results?DB=EPODOC&sf=a&PN=WO2004063260&CY=ep&PGS=10&ST=advanced&LG=en>

Primary Reference and its Disclosure and Inadequacy(ies)	Secondary Reference	Inadequacy of Combination vis-à-vis Claims
WO 03/082966 (Compeco Pty. Ltd.) ⁴ -- discloses crosslinkable or cross-linked nanofiller compositions, not POA as defined and claimed by Applicants. Also, this reference does not note criticality of amount of hydroxide flame retardant needed.	5,889,087 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '087 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,232,377 (Hayashi et al.)	Pending claims require POA as defined, not any two polyolefins. No disclosure in '377 of <i>intercalated</i> nanoclay for any purpose. No POA + <i>intercalated</i> nanoclay in this combination of references.
	6,414,070 (Kausch et al.)	Pending claims require POA as defined, not any two polyolefins. As stated in the August 11, 2006 response, Kausch et al. limits themselves in amount of optional inorganic flame retardant well below that claimed by Applicants as significant to the ASTM E84-01 flame test.
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Applicants now respond to the statements made by the Office in the Final Rejection:

1. **"Fukui et al. reveal polypropylene, clay intercalated with polyamide and ethylene-alpha-olefin copolymer in claim 1."** -- Fukui et al. do not teach specifically the ethylene-alpha-olefin to be an ethylene-octene copolymer. Please see Col. 5, lines 26-30, where the carbon atoms are "3-20" but do not select "octene" specifically. Applicants identify ethylene-octene copolymer as "preferred because of the variation possible in melt flow properties of the resulting copolymer." Moreover, Fukui et al. do not disclose or claim the polyolefin matrix to be limited to choices of polyethylene, ethylene-vinyl-acetate, and combinations of them as now claimed in

⁴ As stated in the August 11, 2006 response, Applicants reserve the right to file a §131 Affidavit to antedate the March 28, 2003 effective date of this reference, if it is not enough for Applicants to have reported in their Supplemental Information Disclosure Statement of June 6, 2006, now of record with thanks, that Applicants' compound successfully passed the ASTM E84 test in September 2002.

Claims 1 and 11. Claim 20 remains unamended in this respect because Fukui et al. do not disclose or suggest a film or sheet having adhesive attached thereto.

2. **"Ebrahimian et al. teach ethylene-propylene copolymer in claim 2."** -- Independent Claims 1 and 11 do not now claim ethylene-propylene copolymers as the first type of polyolefin. Ebrahimian et al. are silent about ethylene-octene copolymer as the second type of polyolefin to provide "hand" as a modulus modifier to the first type of polyolefin. Ebrahimian et al. do not disclose or suggest a laminated film or sheet having adhesive attached thereto.

3. **"Fukutani et al. recite copolymers of ethylene with alpha-olefins in claim 3."** -- Claim 3 recites a list of polyolefin resins without teaching or suggesting that one should use two of them which "are of different types" and in which the second type "modifies the modulus" of the first type. None of the 36 examples of Fukutani et al. identifies even one instance where there is more than one polyolefin to serve as a matrix, let alone a polyolefin alloy as Applicants claim that is the combination of (a) polyethylene or ethylene-vinyl-acetate copolymer or both and (b) ethylene-octene copolymer, as claimed in Claims 1 and 11 and their respective dependents. Claim 20 is not as limited because Fukutani et al. do not teach or suggest uses as films or sheets with adhesives.

4. **"Cheung et al. display nanoclays in paragraph 0009 and ethylene-alpha-olefin in claim 3."** -- Claim 3 teaches propylene-ethylene copolymer or propylene-C₄₋₂₀ copolymers. Applicants' Claims 1 and 11 and their respective dependents claim ethylene-octene copolymer.

5. **"Since all polyolefins are crosslinkable Compco's polymers are the same as applicants'. Crosslinkable is not synonymous with crosslinked"** -- Compco's claim 3 recites a list of polyolefin resins without teaching or suggesting that one should use two of them which "are of different types" and in which the second type "modifies the modulus" of the first type. None of the 25 examples of Compco identifies even one instance where an elastomeric olefin copolymer of ethylene-octene is used as a second type of polyolefin to modify the modulus of the first type of polyolefin. Moreover, Compco does not appreciate the criticality of the amount of

hydroxide flame retardant to be at least 65 parts by weight as compared to 100 parts by weight of polyolefin alloy.

6. **"The secondary references are cited to show [t]he customary amounts of flame-retardants in polyolefin alloys and customary uses for polyolefin alloys."** -- As seen in the chart above, each of the six primary references is deficient alone or in combination with the four secondary references with respect to the particular type of polyolefin alloy as now claimed. *None of the six primary references recognize the criticality for "hand" of having a polyolefin alloy of "two different types" and in which the second type "modifies the modulus" of the first type.* Also, none of the four secondary references recognize the criticality for "hand" of having a polyolefin alloy of "two different types" and in which the second type "modifies the modulus" of the first type. The closest single reference, Kausch et al., does not recognize the importance of having a combination of polyolefins in an alloy which provides "hand" (see page 6, line 1 of Applicants' specification) even though Kausch et al. are disclosing in the field of flame-retardant sheet laminates. Moreover, Kausch et al. fails to recognize the criticality of the amount of hydroxide flame retardant that must be present. All of Applicants' claims require **wherein one inorganic flame-retardant is a hydroxide present in the compound of at least 65 parts by weight, per 100 parts by weight of polyolefin alloy.** Not one of Kausch et al.'s 24 examples use two polyolefins, where one is polyethylene or ethylene-vinyl-acetate copolymer or both and the modulus-modifying one is ethylene-octene copolymer.

7. **"These secondary references do not have to show every aspect of the claimed invention (all of the ingredients or all of the amounts or all of the uses), they just have to supply the missing ingredient, quantity or use, to one of ordinary skill in the art; at the time the invention was made. This hypothetical person would look in other patents to find out what concentration levels other flame-retardants are used in similar formulations in order to optimize properties."** -- Applicants believe that the law requires the Office to point out, without the benefit of hindsight, where each of the elements of the combination so claimed is located in one or the other of the references AND to show a reason why

one skilled in the art would have a reason, for example, to look in the wire and cable technological arts for flame retardants to add to intercalated nanoclays of the primary references in the flame-retardant film and sheet technological arts, when the primary references seem quite content with the combination of ingredients that they do disclose. The job of the Office is quite difficult, transporting through time back to the filing date of the pending application and constructing a hypothetical skilled person who has all knowledge at hand, *and then* having that hypothetical skilled person assemble with ordinary skill, in an obvious way, the combination that applicants have claimed. In this instance, as now claimed, Applicants' polyolefin alloy is distinguishable from all 24 combinations of references AND Applicants' combination of flame-retardant agents is distinguishable from all 24 combinations of references, when considering the limitation of at least 65 parts by weight of hydroxide.

Applicants assert it is NOT obvious to that hypothetical skilled person to pick from 10 references in 24 possible combinations to find Applicants' claimed particular polyolefin alloy and flame-retardant agent combination. The probabilities are just too great without the benefit of hindsight.

8. "It is well settled that it is a matter of obviousness for one of ordinary skill in the art to combine two or more materials when *each* is taught by the prior art to be useful for the *same purpose*." (Emphasis added by undersigned.) -- Applicants' combination of materials, *as now claimed*, is not taught by the prior art in a single reference of the 10 cited or any of the 24 combinations of them used by the Office. Therefore, Applicants' amendments and these remarks have overcome all 24 combination-reference rejections. With all due respect to the Office, the prior art cited by the Office is not useful for the *same purpose*. That is part of the problem with the rejections employed, even before the amendments and these remarks. The Office has jumped from one type of flame-retardant polyolefin art to another type of flame-retardant polyolefin art without explaining why that is appropriate. Applicants have pointed out in the first response and in this second response that flame-retardant polyolefin compounds intended for film and sheeting purposes are quite different from wire and cable flame-retardant polyolefin compounds. Applicants' compounds require

two different types of polyolefins in the alloy -- now quite specifically claimed -- and a set of flame retardant agents -- one based on *charring*-intercalated nanoclay and the other requiring a certain minimal amount of *water-volatilizing* hydroxide⁵. These compounds are patentable *because* that combination passed a stringent ASTM Test E84 which permits product to be sold into the wall and ceiling covering industry. One can not step from wire and cable insulating technology to film and sheet technology without stepping from one test compliance environment to a completely different test compliance environment. No hypothetical skilled person would try that without considerable real-world consequences. As stated on Page 2 of Applicants' specification, there are even different test compliance standards within product category for films and sheets, depending on where those films and sheets will be used⁶.

9. **"Kausch et al. indicate that a flame-retardant polyolefin alloy can be used for laminates."** -- As stated in Applicants' specification at Page 2, Lines 3-10, Kausch et al. considered inorganic flame retardant optional and disclosed flame retardant laminates that passed the MVSS-302 test, a motor vehicle test. But Applicants have invented and claimed a compound that requires both intercalated nanoclay as one flame retardant and an inorganic flame retardant of hydroxide of at least 65 parts by weight per 100 parts by weight of polyolefin alloy, in order to pass ASTM E84 test --- *which is the more stringent flame test than MVSS-302*.

Conclusion on §103 Rejections

Confronted with 10 references and 24 combinations, the undersigned has undertaken a careful categorization and refutation of each of the 24 combination rejections.

⁵ Please see Page 11, Lines 9-18 of Applicants' specification.

⁶ As stated on Page 1, Line 15 of Applicants' specification, "Fire kills people and destroys property." Therefore, test compliance standards are critical for use by the hypothetical skilled person during examination of claims to compounds for this invention, that after all, is entitled: "Flame-Retardant Polyolefin Compounds and Their Use in Surface Coverings."

The amendments made to the Claims, properly "under Final" from within dependent claims, have addressed the claim objections and §103 rejections. The new combination of elements constituting the claimed flame-retardant compound has resulted in patentable subject matter for all pending Claims, as emphasized by these extensive remarks.

As stated in the first response of August 11, 2006, it is hoped that the Office will take into consideration the differentiation of claimed subject matter when reviewing the pending claims and these remarks.

For example, Claims 4 and 14 emphasize the one type of polyolefin is actually two different polyethylene polyolefins and ethylene-vinyl acetate.

Claims 18-20 are especially patentable because the claimed article is a surface covering comprising a film of the compound of Claim 1, attached to a water-based adhesive etc. Of the references cited, only the Compco article quite generally and Kausch et al. in any detail discuss laminates of any kind. Neither of them state anything whatsoever about the type of adhesive to be used in the laminate for a surface covering. And neither of them demonstrate or even suggest the ability of the laminate to pass the industry standard ASTM E840-01 flame test for interior walls.

Applicants have found, unexpectedly, when compared with all 24 combinations, that a combination of polymers to make a polyolefin alloy and a combination of flame-retardant agents can be assembled into a compound that has sufficient polymeric integrity and feel ("hand") and sufficient flame retardancy to pass a stringent building code test for flame retardant surface coverings for occupied buildings.

Applicants and their Assignee request a Notice of Allowance for all pending Claims 1, 4-6, 8-12, and 14-20.

If there are any matters that prevent a Notice of Allowance, the Examiner is invited to contact the undersigned by telephone. If there are some dependent claims

10/560,803
Campbell et al.
GAU: 1714 (P. Szekely)

that are allowable even the independent claims are not, the Examiner is invited to contact the undersigned by telephone to forestall the necessity of appeal.

Respectfully submitted by:

November 22, 2000
Date

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